Double-Sided Externalities and Vertical Contracting: Evidence from European Franchising Data

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Abstract

This paper deals with contractual design and vertical relationships within a franchise chain, in the field of the literature on share contracts. Within a double-sided moral hazard, the contract sharing the profit generated by the vertical decentralized structure results from the necessity to incite both the franchisee and the franchisor. This paper takes into account the five franchisor incentive mechanisms in order to study the chosen type of vertical coordination in different contexts. Using a multinational European dataset, we provide evidence that the two-sided externalities and monitoring costs have an influence on the type of vertical coordination in the network.

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Key Words: Agency theory, econometrics of contracting, vertical restraints.

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I. Introduction

The relationships within a distribution network are characterized by a range of externalities under uniform-price contracts. Vertical and horizontal externalities associated with moral-hazard and incentive problems have been highlighted by the agency literature. This paper deals with the bilateral contracting between an upstream firm and the representative retailer in a franchise chain.

Business-format franchising is based on the hiring of immaterial goods, that is to say the franchisor's mark. Moreover, in the franchise relationship, the provision and the promotion of the brand name value can be seen as the main task of the franchisor. This effort generates a vertical positive externality affecting the franchisee sales result.

On the other hand, the franchisee selling effort also produces a vertical externality on the franchisor's profit. This failure is emphasized by the horizontal intra-brand externality, and the related free-riding problem concerning the selling effort.

"Selling effort" has to be understood in a broad sense, including all the retailer's actions to increase demand, for example: information on the product, highly trained sales staff and post-sale services. The horizontal externality appears when a proportion of the selling effort in one outlet increases demand within other outlets. It emerges within an intra-brand competition, which involves a network of retailers sharing a same brand name. In this situation, a distributor can free-ride, and benefit from the other retailers' efforts to promote the brand name, without bearing the costs.

This horizontal externality at the distribution level is unfavourable to the producer because it results in a sub-optimal level of the selling effort. More generally, this externality raises the problem of network protection, when several legally autonomous units share a same brand name, or benefit simultaneously from a reputation.

In this analytical framework, the vertical contract is either a way to incite (i.e. to reward) or to constraint (i.e. to monitor) the franchisor‘s effort concerning the brand name value, and the franchisee‘s effort towards the selling activity. Incentive is the target of the share-contract, in other words of the monetary terms sharing the profit generated by the decentralized vertical structure.

This explanation has been formalized by the double-sided moral hazard model in franchising developed by Lal (1990), Bhattacharyya and Lafontaine (1995). This model takes

into account the upstream and the downstream vertical externalities, inducing that the share contract is the result of both parties' need for incentives.

This framework finds support in the empirical literature. By comparing several agency models (risk-sharing, one-sided and two-sided moral hazard models), Lafontaine (1992) shows that data is more consistent with incentive issues on both sides. Agrawal and Lal (1995) confront the predictions from the theoretical model presented in Lal (1990) with data. They find empirical support to the incentive-based explanation for the use of royalty-rate in franchise contracts. Brickley (2002) proxies the moral hazard on franchisor's side and highlights its impact on the monetary provisions. Lastly, Vazquez (2005) takes into account risk sharing and bilateral moral hazard issues, as Lafontaine (1992). His empirical results are consistent with the agency framework.

So, while the prior literature in the agency framework has focused on the franchisee's side externality and the need to provide contractual incentives downstream (Mathewson and Winter, 1985; Norton, 1988), the two-sided moral-hazard explanation shows that the franchisor's remuneration is also at stake.

In this field, most work has been done on the franchise fee and the royalty rate as incentive devices for the franchisor. Vazquez (2005) includes in the analysis two additional sources of revenue for the upstream firm: the advertising rate, and the rents from the sales of inputs to the franchisee.

This empirical paper is an attempt to take account of the five franchisor's sources of revenue in order to study the impact of the two-sided externalities and monitoring costs on the share contract, and more broadly on the type of vertical coordination chosen by the upstream firm. Besides the two main monetary provisions (up-front fee, royalty rate), the advertising rate and the inputs sales, we add to the analysis the rate of owned units in the franchise chain.

The advertising rate is a contractual provision which financially involves the downstream firm with the promotion of the brand name in charge of the franchisor. Like the royalty rate, it is usually a percentage of the downstream sales. Within some networks the franchisee not only uses the franchisor's brand name, but he also retailers the upstream firm's products. These input sales represent significant revenue for the franchisor when the prices are higher than marginal costs. Finally, owned units, directly managed by the franchisor, represent another source of revenue.

Most agency models of franchise contracting imply that the royalty rate and the up-front fee are inversely related: the royalty rate is chosen first, as a function of incentive and risk issues; the franchise fee comes second to extract rents left downstream by the royalty rate. However, the empirical literature provides evidence that these two monetary provisions are not necessarily negatively related, and that the initial fee charged to the franchisee may not be a major source of profits for the upstream firm.

Royalties and owned units are also regarded as substitutes, because they are two alternative ways for the franchisor to gain some revenue (Scott, 1995).

In order to deal simultaneously with these franchisor incentive mechanisms, our first step is to construct a dependant variable combining them. More precisely, this article is organized as follows. Section 2 discusses the analytical framework using a simple model of vertical contracting with two-sided externalities. Section 3 describes the data on three leading European countries in franchising, and the elaboration of the dependant variable by means of a statistical classification. Section 4 sets out the testable qualitative predictions. Section 5 presents the empirical specifications regarding the explanatory variables, and descriptive statistics. The estimations are contained in section 6. The results are mainly consistent with the hypothesis provided by the analytical framework. Concluding comments are offered in section 7.

II. Analytical framework

In order to study the features of the share contract, we focus on a bilateral relationship between a franchisor and a franchisee within a network sharing the same brand name. All the franchise contracts are assumed to be identical in the chain, so the downstream firm is the representative retailer. The franchisor designs the contract, and the franchisee decision consists in accepting or rejecting it.

In such a situation, residual claimancy appears to be the most incentive mechanism for the downstream firm. In that case, the contract includes an up-front fee (F) and no royalties. Once the entry fee is paid, the franchisee captures the totality of the results from its sales effort. Because the franchisors' profit does not depend anymore on the sales results, that is to say on the franchisee's effort, this arrangement suppresses the vertical externality.

However, Bhattacharyya and Lafontaine (1995) demonstrate that royalties are required with double-sided externalities, even with risk neutral parties. In this case the optimal royalty-rate incites

both the franchisor and the franchisee to invest in their respective inputs (effort). In addition, they show that the size of the network does not affect the optimal share parameter; the royalty rate is uniform across franchisees. For these reasons their model for profit sharing contracts in franchising is a main reference here.

The problem associated with the use of a royalty rate in the franchise contract is the decrease of the franchisee's incentives. Scott (1995) explains that the presence of owned units in the chain limits this dilemma. Distribution outlets directly managed by the upstream firm are an alternative way for the franchisor to have an ongoing interest in the profits of the system. This is why, in a dual distribution chain, the royalty rate should be lower. We assume that the share contract is dependent on the context, in other words that the royalty rate is affected by the other incentive devices for the franchisor.

Like Bhattacharyya and Lafontaine (1995), we suppose that the production function for the vertical decentralized structure is as follows:

$$X = f(e,r) + \mu \qquad (1)$$

where X, the total monetary return produced, is the only contractible variable.
e denotes the franchisee's effort, r the franchisor's effort and μ is a random term with mean zero and variance σ^2. The realization of μ is assumed to be unobservable to both parties, as the effort levels. For this reason any enforceable contract has to be based on the output level. Both parties are assumed to be risk neutral.

f is a standard neoclassical production function. f_e and f_r denote the partial derivatives.

f_e and $f_r > 0$
f_{ee} and $f_{rr} < 0$
$f_{er} > 0$ and $f(0,r) = 0$ and $f(e,0) = 0$

This last assumption involves a team production: efforts on both sides are required for any production to occur.

The disutility functions are *U(r)* for the franchisor and *V(e)* for the franchisee. We assume both of them to be increasing and constant in effort[1]:

$$U'(r) > 0 \text{ and } U''(r) = 0$$
$$V'(e) > 0 \text{ and } V''(e) = 0$$

The five sources of revenue for the franchisor are denoted by *F,* α, β, φ and λ, with:

F = the up-front fee

α = the advertising rate on the output

β = the royalty rate on the output

φ = the rate of owned units in the network

λ = the rents on the input sales

The advertising rate is a complementary provision to the royalty rate. The following sums up the two devices. The possible presence of input sales affects the franchisor's remuneration. This presence – or not - is related to the kind of activity in the network, with two possibilities: λ = 1 or λ = 0. We take account of two sorts of chains: pure franchising systems (φ = 0) or dual distribution (φ ≠ 0), considering that the share contract in a bilateral franchising relationship is impacted by the type of the network. When φ ≠ 0 or λ ≠ 0, β tends to be lower. In other words, the share parameter varies with the context (rents from the input sales or not, dual distribution or not).

The maximization program for the franchisor is then written as:

$$\max_{e,r}\left\{F + \left(\alpha + \beta^{\lambda+\varphi+1}\right) f(e,r) - U(r)\right\} \qquad (2)$$

Subject to:

(i) $(\alpha + \beta^{\lambda+\varphi+1})\, f'_r(e,r) = U'(r)$

(ii) $(1 - \alpha - \beta^{\lambda+\varphi+1})\, f'_e(e,r) = V'(e)$

(iii) $(1 - \alpha - \beta^{\lambda+\varphi+1})\, f(e,r) - F - V(e) \geq k$

[1] The assumption of constant marginal costs of efforts is required within the context of a distribution network (see the case of multiple franchisees in Bhattacharyya and Lafontaine, 1995)

With:

$0 \prec \varphi \leq 1$

$1 \prec \varphi + 1 \leq 2$

$\alpha + \beta^{\lambda+\varphi+1} \leq 1$

Constraints (i) and (ii) represent respectively the franchisor's and franchisee's incentive constraints, and (iii) is the franchisee's participation constraint, with k being the franchisee's reservation utility.

From the participation constraint we know that $f(e,r)$ must be positive, otherwise *F* would have to be negative. But then the franchisor earns negative profits and is better off not contracting with the franchisee. For $f(e,r) > 0$, the team production assumption involves that both *e* and *r* are positive. *U'(r)* and *V'(e)* are both positive. Then if $\alpha + \beta^{\lambda+\varphi+1}$ were either 0 or 1, one of the incentive conditions would not be satisfied. As a result $\alpha + \beta^{\lambda+\varphi+1}$ must be strictly between 0 and 1 which means that with double-sided externalities and needs for incentives, the output must be shared between the franchisor and the franchisee.

$$\alpha + \beta^{\lambda+\varphi+1} = \frac{[U'(r)/\ f'r(e,r)]}{V'(e)/\ f'_e(e,r) + U'(r)/\ f'_r(e,r)} \qquad (3)$$

For a given level of ($\alpha + \beta^{\lambda+\varphi+1}$), the effort levels adjust so that the franchisor's contribution to the sum of marginal disutility weighted by respective productivities is equal to the franchisor's remuneration. So ($\alpha + \beta^{\lambda+\varphi+1}$) is increasing in the relative importance of the franchisor's effort.

The franchisor and the franchisee share the output equally ($\alpha + \beta^{\lambda+\varphi+1}$=1/2) when they have equal marginal productivities ($f'_r(e,r) = f'_e(e,r)$) and equal disutility of effort ($U'(r) = V'(e)$).

F, the up-front fee, is not present in (3). This observation is coherent with the idea that this fee affects neither the choice of effort, nor total surplus. More generally, it is consistent with the proposal that the franchise fee is chosen to meet the franchisee's reservation utility (*F* is included in the franchisee's participation constraint), whereas the share-parameters ($\alpha + \beta^{\lambda+\varphi+1}$) allow the repartition of the surplus. At the same time, the franchisor would use *F* to extract rents left downstream.

Finally, this model shows that the share contract, and more precisely here the franchisor's remuneration, determines the two parties' efforts. Originally, these effort levels are related to both

the two-sided externalities and the monitoring costs, in other words to the possibility for one party to constraint the other. When the monitoring costs are high, which means that it is difficult to monitor the other firm, incentives are an appropriate way to favour the other party's effort.

Considering this context (potential externalities, monitoring costs), the upstream firm designs the type of vertical coordination (mainly: the rate of owned units in the network and the royalty rate on each franchisee's output) defining the levels of the optimal efforts.

III. International and multi-sector data

1. FRANCHISING IN EUROPE

Europe appears to be the continent of franchise. According to the European Franchise Federation, 2500 distinct franchised brands were operating in the United States in 2007, whereas about 8300 were operating in Europe. So the number of franchised brands in the United States is only 30 percent of the total number of distinct brands in Europe. Moreover, most franchised brands operating in Europe (close to 80%) are domestic ones, native to Europe.

The countries concerned are: Austria, Belgium, Britain, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Portugal, Slovenia, Spain, Sweden, Switzerland, Poland, Russia and Turkey. Our empirical study compiles data concerning the three leading European countries for franchising: France, Germany and Spain.

Another feature of the franchising sector in Europe is its diversity. Our unique collected dataset takes into account a wide range of activities, grouped together into 8 main sectors.

2. THE SAMPLE

Our dataset was extracted from a computerized version of the 2006 *Forby's Franchise Guide*. The information contained in this source comes directly from the networks. The sample consists of 1869 chains, in three European leading countries for franchising: Germany, Spain and France (table 1).

Table I. International distribution of sample networks (1869 networks)

Country	Number of Networks
Germany	681
France	528
Spain	660

The data includes a broad range of trade and service industries. We distinguish eight sectors (table 2): services for individuals (SERVIND), services for businesses (SERVBUSINES), miscellaneous services for businesses and individuals (MISCEL), equipment for individuals (EQUIPINDI), home equipment (HOMEQUIP), hotels/coffee-bar/restaurants (HCR), automobile (AUTO) and food (FOOD).

Table II. Sector-based distribution of sample networks (1869 networks)

Sectors	Label	Part in the Sample
Services for individuals	SERVIND	12.3%
Miscellaneous services for individuals businesses	MISCEL	17.9%
Automobile	AUTO	4.8%
Food	FOOD	7.2%
Equipment for individuals	INDEQ	18.3%
Home equipment	HOMEQ	16.2%
Hotels, Coffee-bar, Restaurants	HCR	15.2%
Services for businesses	SERVBU	8.1%

3. TWO KINDS OF VERTICAL CONTRACTING

In order to study the impact of the bilateral externalities and monitoring costs on contracting within a distribution network, we discern in the sample two main types of vertical relationships by means of a statistical classification[2].

This classification takes into account the two main monetary provisions (the up-front fee and the royalty rate) and two additional sources of revenue for the franchisor: the advertising rate and the proportion of owned units. We construct the variable ROYALTY combining the royalty and the advertising rates.

Input sales are not included here for two reasons. First, in the dataset, the information concerning this variable is only available as a dummy indicating the presence or absence of inputs sold by the franchisor to the franchisees. The second, and main reason, is that this is not a decisional variable for the franchisor, because it is related to the type of activity in the network. However, considering that rents from the input sales may affect the share-contract and the type of vertical relationship, we include them later, in the econometric model, as an explanatory variable.

Table 3 presents the variables used for the k-means classification.

Table III. Variables used to define the type of vertical relationship (1869 networks)

Variable	Measures	Mean	Std.Dev.	Min.	Max.
ROYALTY	Royalty + advertising rate	3.004	3.089	.000	15
FEE	Up-front fee (€) *	1.263	1.012	.100E-02	7.2
OWNRATE	Number of owned units in the network / size of the European network.	.981E-01	.254	.000	1

* values divided by 10 000

The classification results in two groups of networks depending on the type of vertical coordination: one using dual distribution (DUAL), and the other using more vertical restraints (RESTRAINTS).

[2] K.means classification.

The first group (DUAL) gathers 908 franchise chains. The typical network in this group includes owned units, the share-contract is characterized by a franchise fee equal to 1 and the sum of the advertising and the royalty rates equal to 0.5.

The second group (RESTRAINTS) represents 961 franchise chains. The typical network includes no owned units, the share-contract is characterized by a franchise fee higher than 1 and royalties higher than 3%.

Tables 4 and 5 present statistics related to the two groups.

Table IV. Summary statistics for CONTRACT (1869 networks)

	DUAL (908 networks)				RESTRAINTS (961 networks)			
Variable	Mean	Std.Dev.	Min.	Max.	Mean	Std.Dev	Min.	Max.
OWNRATE	0.128	0.290	0	1	0.068	0.210	0	1
FEE	1.045	0.889	0.01	7.15	1.421	1.065	0.03	7.2
ROYALTY	0.414	0.681	0	2.24	5.576	2.298	2	15
FRANCE	0.273	0.445	0	1	0.291	0.454	0	1
GERMANY	0.367	0.482	0	1	0.361	0.480	0	1
SPAIN	0.359	0.479	0	1	0.347	0.476	0	1
SERVIND	0.130	0.337	0	1	0.116	0.320	0	1
MISCEL	0.193	0.394	0	1	0.167	0.373	0	1
AUTO	0.049	0.216	0	1	0.048	0.214	0	1
FOOD	0.079	0.270	0	1	0.067	0.250	0	1
INDEQ	0.240	0.427	0	1	0.129	0.336	0	1
HOMEQ	0.157	0.364	0	1	0.166	0.372	0	1
HCR	0.081	0.273	0	1	0.215	0.411	0	1
SERVBU	0.069	0.254	0	1	0.091	0.289	0	1

As shown by table 4, within the networks classified as DUAL, the rate of owned units is higher and, on the contrary, the royalty rate and the franchise fee are far lower.

Table V. Distribution of the two vertical relationships (1869 networks)

Variable	DUAL (908)	RESTRAINTS (961)	
FRAN	46.97%	53.03%	100%
GERM	49.04%	50.96%	100%
SPAIN	49.39%	50.61%	100%
SERVIND	13.04%	11.63%	
MISCEL	19.26%	16.61%	
AUTO	4.90%	4.76%	

FOOD	7.90%	6.64%
INDEQ	24.04%	12.96%
HOMEQ	15.79%	16.61%
HCR	8.13%	21.59%
SERVBU	6.94%	9.20%
	100%	100%

Table 5 shows that there are many networks classified as DUAL in the "Equipment for individuals" sector, and many networks classified as RESTRAINTS in the "Hotels, Coffee-bar, Restaurants" sector.

This table highlights the fact that there are no main international differences in the distribution of the two kinds of vertical contracting.

Finally, three conclusions emerge from the classification:

1/ The royalties and the owned units appear as two alternative ways to remunerate the franchisor. This result is consistent with the analytical framework.

2/ However, contrary to what is suggested by the theoretical models of franchising, the fee and the royalty rate are not inversely related here. Lafontaine (1992), Scott (1995), Lafontaine and Shaw (1999) obtain a similar result from econometric estimations on American data. The general explanation is that the franchisor does not extract the whole rent downstream.

3/ The choice to have - or not - owned units in the chain appears to be a key determinant of the classes, and a key determinant of the vertical relationships designed by the upstream firm. This issue is precisely the focus of attention in the literature on dual distribution (Bai and Tao, 2000; Pénard et al., 2003; Lafontaine and Shaw, 2005).

The presence of owned units in the chain can be interpreted as a credible commitment of the franchisor to promote the brand name, because in this case he is directly involved in the network (Scott, 1995). In addition, it is a means for the franchisor to monitor the franchised units (Lafontaine and Shaw 2005), notably by being geographically close to them.

Considering the analytical framework and the above results, it is possible to formulate several testable predictions.

IV. Testable predictions

Underlying assumptions can be made concerning the type of vertical relationship preferred by the franchisee and the franchisor.

It is indeed relevant to assume that the franchisee prefers DUAL networks to RESTRAINTS networks: DUAL means i) less monetary restrictions, meaning the contract is closer to residual claimancy, and ii) the franchisor is committed to the promotion of the shared brand name because he operates certain outlets.

The situation is more ambiguous when it comes to the franchisor's preference. He will prefer RESTRAINTS if franchised units are regarded as more profitable than owned units (Gallini and Lutz 1992, Lafontaine 1993, Scott 1995).

However, to include owned units in the network (DUAL) is a way for the franchisor to preserve the brand name value within a context of downstream opportunism, and a means of monitoring the franchised units. So, when the potential downstream externality is high, we may observe a vertical coordination corresponding to DUAL. This consideration leads to our first testable prediction.

1. FRANCHISEE'S SIDE EXTERNALITY

Taking into account the fact that it is easier for the franchisor to monitor the franchisees and to promote the brand name value when the network includes some owned units, we assume that:

Hypothesis 1: The higher the probability of having more vertical integration in the network (DUAL), the higher the potential downstream horizontal externality (potential free-riding on the promotional effort).

Since Brickley (1999), this hypothesis is common in the agency empirical literature on franchising.

2. FRANCHISOR'S SIDE EXTERNALITY

It is common for agency models to focus on the selling effort of only one party, the agent. Our analytical framework incorporates the necessity within the vertical relationship to provide incentives for the franchisor's effort too.

If owned units are a means to promote the brand name, it is pertinent to assume that a chain with a strong reputation has no need for owned units (RESTRAINTS). When the brand name value is high, we may observe a vertical coordination corresponding to RESTRAINTS, considering that i) franchising signifies renting out a brand name, and that ii) franchised units are more profitable than owned units.

However, the reverse hypothesis is relevant: the more the brand name value is high, the more the downstream opportunism is a problem therefore the franchisor must exert greater control (DUAL).

This is why we formulate the following hypothesis:

Hypothesis 2: The higher the probability of having more vertical restraints in the network (RESTRAINTS), the higher the brand name value. Nevertheless, the reverse sign is pertinent.

3. FRANCHISEE'S SIDE MONITORING COST

Within contracts of low duration, it is easier for the upstream firm to monitor the franchised units by excluding shirking franchisees from the network. For this reason, contract duration and owned units can be seen as two alternative ways to control the franchisees. As a consequence, we may observe a vertical coordination corresponding to RESTRAINTS when the duration is low. We can therefore predict that:

Hypothesis 3: The higher the probability of having more vertical restraints in the network (RESTRAINTS), the lower the cost of monitoring the franchised units (short duration).

4. FRANCHISOR'S SIDE MONITORING COST

We take into account the difficulty for the franchisees to monitor the franchisor's effort by means of the presence - or not - of a franchisees council in the network. Such councils assemble elected franchisees and franchisor managers. They are a way for the franchisees to counterbalance the decisional power of the upstream firm. Regarding owned units as a commitment from the franchisor

to promote the brand name, the presence of a franchisees council in the network can be seen as a substitute for owned units. For this reason, we assume that:

Hypothesis 4: The higher the probability of having more vertical restraints in the network (RESTRAINTS), the lower the cost of monitoring the franchisor (presence of a franchisees council).

V. Empirical specifications

1. EXPLANATORY VARIABLES

A. Measuring the free-riding on the selling effort

The size of the network (SIZE) is the number of outlets sharing the same brand name, franchised and owned units. Logically, the wider it is the higher the potential intra-brand horizontal externality. Consequently, the vertical coordination in the chain may correspond to DUAL (*Hypothesis 1*). This proxy variable has been previously used in the same way by Arrunada et al. (2001).

We use a second proxy for the horizontal externality: the number of potential customers per outlet (TERRITORY). This is an area delimiting the scope of each outlet. It functions in a reverse way compared to the first proxy: the wider it is, the lower the potential intra-brand horizontal externality. Therefore, we expect a choice for RESTRAINTS (*Hypothesis 1*) in the chain.

B. Measuring the brand name value

The age of the network is frequently used as a proxy for the brand name value (Lafontaine, 1992 ; Arrunada et al., 2001). In this case we refer to the company's date of creation minus the first franchised unit's date of creation (AGE). The above result corresponds to the lapse of time required to create the concept that will be franchised later. The longer the period of time the more valuable the concept. Therefore, we expect a positive link between this proxy variable and the choice for RESTRAINTS (*Hypothesis 2*).

Another proxy for the brand name value is the power of the chain, in terms of turnover. We use the network turnover divided by the sector turnover (LEADER). Here again, a positive sign is expected with RESTRAINTS (*Hypothesis 2*).

C. Measuring the monitoring costs

As mentioned above, the cost of the franchisor's monitoring of the franchisee is estimated according to the length of the contract (DURATION). This is a contractual provision, defined at the beginning of the relationship. A long duration (high monitoring cost) should correspond to DUAL (*Hypothesis 3*).

In order to measure the franchisee's difficulty monitoring the franchisor, we use a dummy variable (COUNCIL) that equals 1 if there is a council in the network, and 0 otherwise. Vazquez (2005) has previously used such a proxy on Spanish data. The presence of a franchisees council in the chain (low monitoring cost) should match with RESTRAINTS (*Hypothesis 4*).

D. Control variables

We include three types of dummy variables that control the country and the sector effects, and the impact of the input sales.

Table 6 sums up all the explanatory variables.

Table VI. The explanatory variables

Downstream horizontal externality *(free-riding on the promotional effort)*	SIZE TERRITORY
Upstream vertical externality *(brand name value)*	AGE LEADER
Downstream monitoring cost	DURATION
Upstream monitoring cost	COUNCIL
Additional franchisor's incentive	INPUTSALES
Country	*dummies*
Sector	*dummies*

2. DESCRIPTIVE STATISTICS

All the variables used for the estimations are presented in table 7. The dependent variable is the dummy variable CONTRACT, defining the type of vertical relationship (DUAL versus RESTRAINTS).

Table VII. The variables (1869 networks: France/Germany/Spain)

Label	Measures	Mean	Std.Dev.	Min	Max
CONTRACT	Dummy variable defining the type of coordination *0: DUAL* *1: RESTRAINTS*	.514	.499	.000	1
SIZE	Size of the European network	118.766	451.724	.000	4600
TERRITORY	Number of potential customers per outlet (divided by 100 000)	.835	3.349	.200E-03	108
AGE	Date of creation of the company minus date of creation of the first franchised unit	7.255	16.754	.000	250
LEADER	Network turnover divided by the sector turnover	.777E-02	.129E-01	.141E-03	.151
COUNCIL	Presence or absence of a franchisees council in the network: dummy variable (1/0)	.422	.494	.000	1
DURATION	Duration of the contract (years)	7.312	10.857	1	110
INPUTSALES	Presence or absence of inputs sold by the franchisor to franchisees: dummy variable (1/0)	.580	.493	0	1
GERMANY	Indicating the country (1/0)	.364	.481	0	1
FRANCE	Indicating the country (1/0)	.282	.450	0	1
SPAIN	Indicating the country (1/0)	.353	.478	0	1
SERVIND	Services for individuals: hair and beauty care, education, sports and leisure. Dummy (1/0)	.123	.328	0	1
MISCEL	Miscellaneous services for individuals and businesses: building, advertising, computers, telecom. Dummy (1/0)	.179	.384	0	1
AUTO	Automobile: maintenance, equipment, rental. Dummy (1/0)	.487E-01	.215	0	1
FOOD	Food. Dummy (1/0)	.731E-01	.260	0	1
INDEQ	Equipment for individuals: textiles, clothing, accessories. Dummy (1/0)	.182	.386	0	1
HOMEQ	Home equipment. Dummy (1/0)	.162	.368	0	1
HCR	Hotels,Coffee-bar, Restaurants. Dummy (1/0)	.151	.358	0	1
	Services for businesses. Dummy				

SERVBU	(1/0)	.081E-01	.273	0	1

VI. Estimations

1. THE MODEL

In order to study the impact of the two-sided externalities and monitoring costs on the vertical relationships we estimate the following logit equation:

$$Prob\,(CONTRACT_i = 1\,/X_i) = \alpha_0 + \underset{<0}{\alpha_1}\,SIZE_i + \underset{>0}{\alpha_2}\,TERRITORY_i + \underset{>0}{\alpha_3}\,AGE_i + \underset{>0}{\alpha_4}\,LEADER_i + \underset{>0}{\alpha_5}\,COUNCIL_i + \underset{<0}{\alpha_6}\,DURATION_i + \alpha_7\,INPUTSALES_i + \sum_{p=1}^{3}\alpha_8^p\,COUNTRY_i + \sum_{s=1}^{8}\alpha_9^S\,SECTOR_i + \varepsilon_i$$

$i = \{1, \ldots, 1869\}$ (1)
$p = \{1, \ldots, 3\}$
$s = \{1, \ldots, 8\}$

Where:

ε = the error term.

i = network

p = country (Germany as reference)

s = sector (Miscellaneous services for individuals and businesses as reference)

The symbols <0 and >0 below the parameters indicate the predicted sign

In order to perform robustness tests, we estimate additional models including no sector dummies (2), or using the probit estimator (3), (4).

2. THE RESULTS

The estimation results are reported in table n° 8.

Table VIII. Results for the dependent variable CONTRACT

Independent variable	*Logit* (1)	*Logit* (2)	*Probit* (3)	*Probit* (4)
	Coefficient (std. error)	Coefficient (std. error)	Coefficient (std. error)	Coefficient (std. error)
CONSTANT	.255** (.123)	.346*** (.109)	.159** (.765E-01)	.215*** (.680E-01)
SIZE	-.193E-03** (.938E-04)	-.222E-03** (.920E-04)	-.120E-03** (.578E-04)	-.139E-03** (.569E-04)
TERRITORY	.248E-03** (.110E-03)	.234E-03** (.106E-03)	.154E-03** (.679E-04)	.146E-03** (.663E-04)
AGE	-.262E-03 (.755E-03)	-.637E-03 (.726E-03)	-.143E-03 (.436E-03)	-.372E-03 (.427E-03)
LEADER	.397E-03*** (.106E-03)	.385E-03*** (.102E-03)	.245E-03*** (.656E-04)	.240E-03*** (.641E-04)
COUNCIL	.234E-03* (.129E-03)	.274E-03** (.125E-03)	.144E-03* (.795E-04)	.169E-03** (.779E-04)
DURATION	.567E-03*** (.131E-03)	.583E-03*** (.128E-03)	.345E-03*** (.799E-04)	.361E-03*** (.790E-04)
INPUTSALES	.267 (.168)	.101E-03 (.196E-03)	.161 (.103)	.621E-04 (.122E-03)
FRANCE	.561*** (.157)	.451*** (.151)	.337*** (.955E-01)	.278*** (.931E-01)
SPAIN	.262E-01 (.155)	.194E-01 (.151)	.144E-01 (.956E-01)	.966E-02 (.935E-01)
Sector dummies	*included*	*not included*	*included*	*not included*
	Results corrected for heteroskedasticity			
Prob[ChiSqd > value]	.00000	.00000	.00000	.00000
Number of observations	1869	1869	1869	1869
% Predicted	62	58.4	62	58.4

* Significant at the 10 % level * * Significant at the 5 % level * * * Significant at the 1 % level

The results are qualitatively similar in the four models, hence leading to the conclusion of robustness.

The variables SIZE, TERRITORY, LEADER, COUNCIL and DURATION have a significant impact in the four regressions concerning the type of vertical relationship *($p < 0.01$ for* LEADER and DURATION, *$p < 0.05$* for SIZE and TERRITORY, *$p < 0.1$* for COUNCIL*)*.

These results lend empirical support to the hypothesis H_1, H_2 and H_4.

As predicted by H_1, the variable SIZE has a negative influence on the probability to have RESTRAINTS. This means that the larger the distribution network, the lower the probability to have a vertical coordination using vertical restraints rather than owned units (RESTRAINTS). In addition, the positive sign concerning the impact of the proxy TERRITORY is as expected: the larger the consumer area for each outlet (low horizontal downstream externality), the higher the probability to have more vertical restraints (higher values for the franchise fee and the royalty rate) and no owned units.

The results concerning the variable LEADER show that the probability for coordination by means of vertical restraints, exclusively, rises with the power of the network in terms of turnover. This is consistent with H_2.

Finally, as predicted by H_4, the variable COUNCIL exerts a positive influence on the probability that the chain chooses RESTRAINTS: the lower the cost of the franchisees' monitoring of the franchisor, the higher the probability of having coordination in the chain by means of vertical restraints and no owned units.

Nevertheless, the positive impact of the variable DURATION on the probability to have RESTRAINTS is the opposite of the predicted one: the longer the contract, the higher the probability to have restrictive monetary contractual provisions instead of owned units in the network. In addition, the time needed to develop the brand name (AGE) used as a proxy for the brand name value, has no significant influence on the type of vertical relationship. A similar unpredicted conclusion can be applied to the input sales.

The dummies for the countries show that the choices made by the French networks differ significantly from the German ones ($p < 0.01$): French networks are more likely to use RESTRAINTS, in other words to use vertical restraints rather than owned units to organise the distribution network.

VII. Conclusion

This research had two goals: i) introducing the five franchisor's payment variables in order to expand the double-sided externalities' theoretical framework, ii) defining the ways in which share-contract differs according to the type of coordination within the vertical structure (dual distribution instead of a pure franchise system, presence –or not- of rents derived from input sales).

The pertinence of this twofold issue is confirmed by an empirical and econometric analysis.

First, the variables related to the franchisor's remuneration and resulting from a strategic decision are synthesized within the variable CONTRACT. The construction of this variable clearly highlights two types of vertical relationships. On the one hand, a network with owned units and a lower level of vertical restraints (DUAL), and on the other, a network without owned units and a higher level of vertical restraints (RESTRAINTS).

The econometric estimations confirm the significant influence of the externalities of both the franchisee's and franchisor's sides on the chosen type of vertical relationship (DUAL versus RESTRAINTS). Furthermore, the results highlight the impact of the two-sided monitoring costs on the above choice.

Dual distribution is one of the main points of this analysis which goes even further. It is the first attempt in literature to combine the issues of dual distribution and share-contract. This combination has proven itself to be an interesting lead for further researches.

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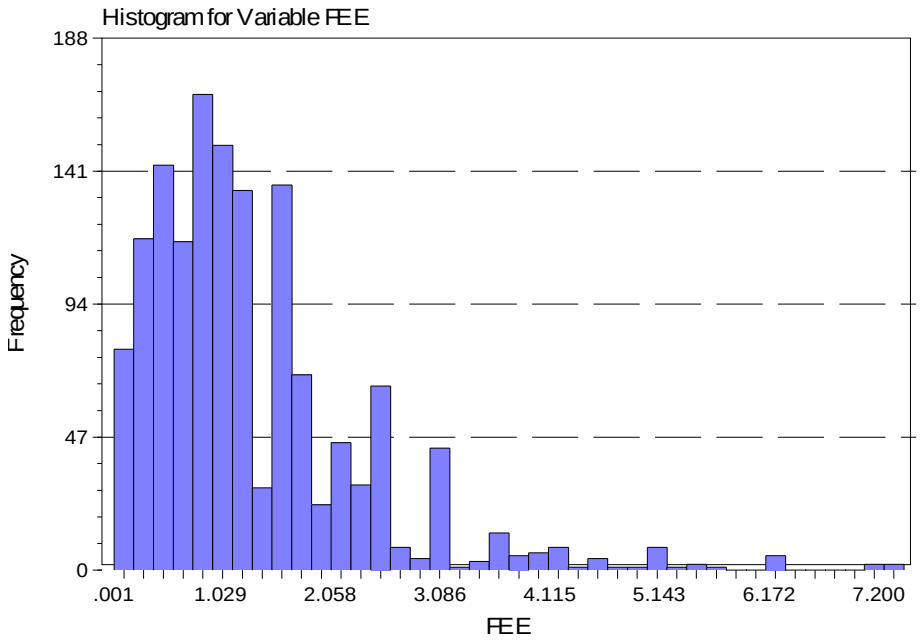
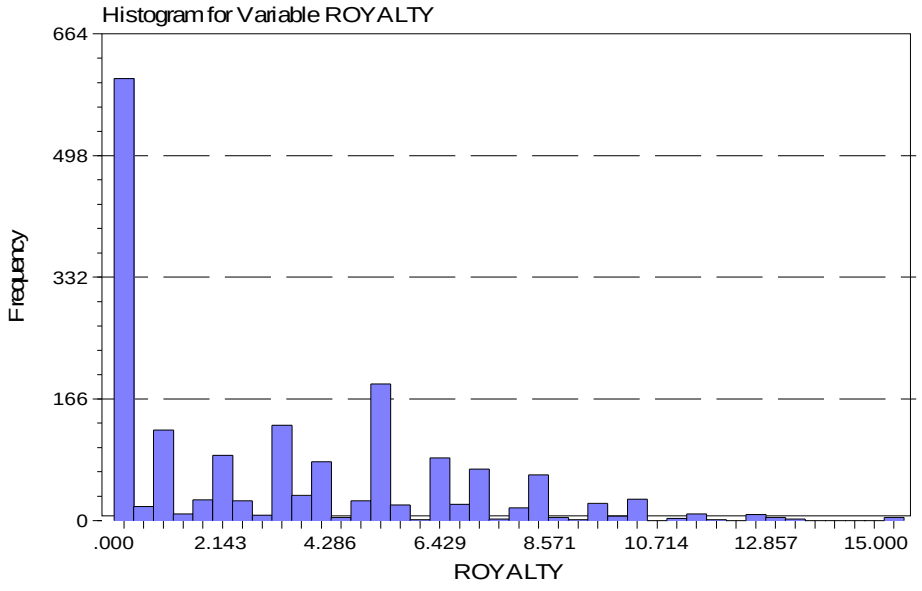
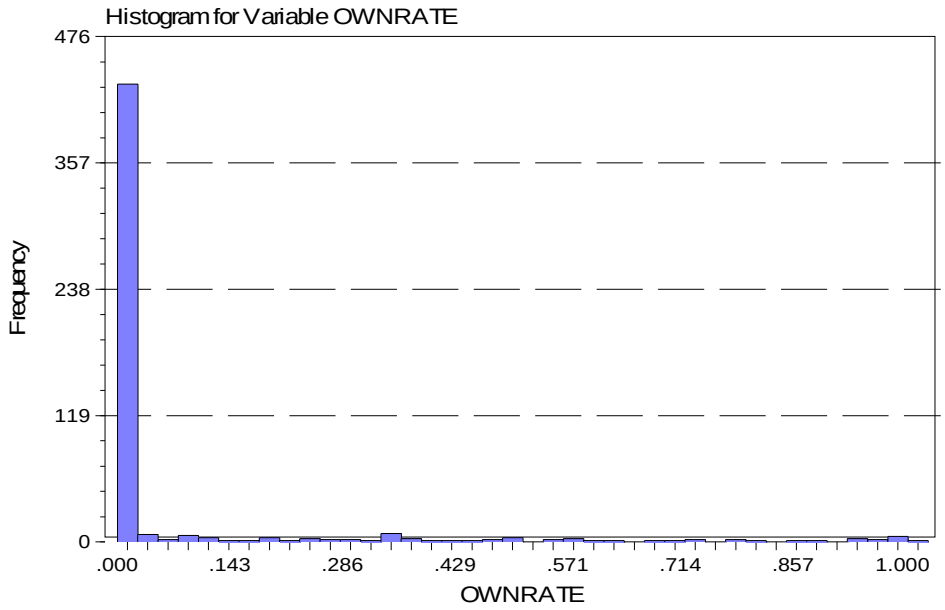
Appendix 1:
Histograms for the three variables defining the two types of contract







Appendix 2:
Summary results for the core explanatory variables

Table IX. Logit equation (1) for CONTRACT

CONTRACT	Expected	Evidence
α_1 (SIZE)	-	-**
α_2 (TERRITORY)	+	+**
α_3 (AGE)	+	*non-significant*
α_4 (LEADER)	+	+***
α_5 (COUNCIL)	+	+*
α_6 (DURATION)	-	+***